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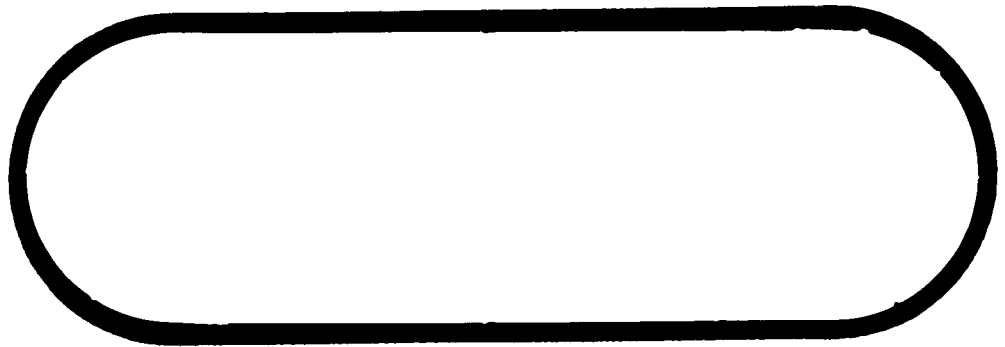
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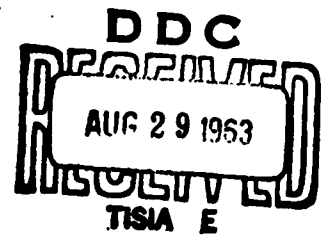
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414501

BOEING



414501



SEATTLE, WASHINGTON

THE **BOEING** COMPANY

CODE IDENT NO. 81205

NUMBER D2-14787-2

TITLE Flight Test Missile Estimated Mass Data (F-180) -
Boeing Components

MODEL NO. XSM-80 CONTRACT NO. AFO4(647)-289

ISSUE NO. _____ ISSUED TO _____

8-8-63

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REV SYM _____

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VOL. NO. 2 OF
SECT. _____ PAGE 1

8-3142-2

ACTIVE PAGE RECORD

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SECT. PAGE 2

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INTRODUCTION

Subsequent to the release of D2-14787-1, STL verbally directed the discontinuance of future Estimated (F-180) reports. Official BSD contractual change notification has not followed, although STL still confirms this direction. (Telecon: D. S. Askins - STL/C. O. Bailey - Boeing, 24 July 1963.) In compliance with the still existing AF O4(647)-289 contractual requirement this report has been prepared and submitted.

This document has been prepared to serve as a mass data summary of the Boeing Responsibility Hardware in the Minuteman Flight Test Program. It provides the pertinent Estimated (F-180) weight, balance and inertia data, as released officially by the Boeing Minuteman Weight Group.

Volume I presented mass data for Flight Test Missiles 437 thru 442. This document (Volume II) presents mass data for Flight Test Missiles 443 thru 445 and Flight Test Missiles 446 thru 448.

FTM 448 represents the final flight test missile in the -289 contract. Therefore this document will be the final release of the Estimated (F-180) reports.

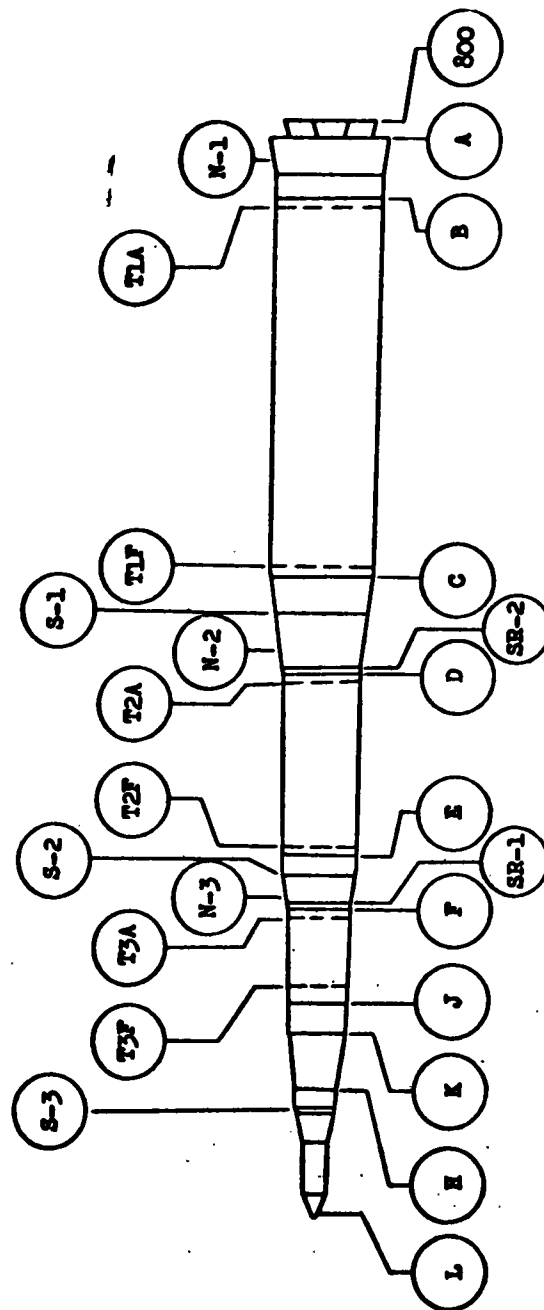
1. FIM 443 THRU FIM 445

A review of the projected FIM 443-445 Estimated (F-180) weight data determined that only minor changes will occur over the released FIM 437-442 data (Ref: D2-14787-1). Therefore all data pertinent to FIM 443-445 are referenced to D2-14787-1.

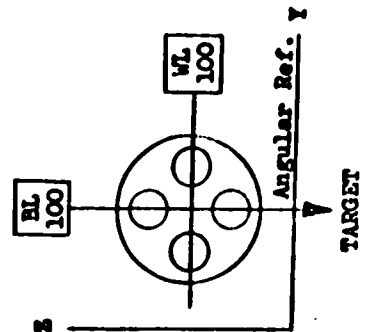
Separation
Planes

Tangent
Lines

Nozzle Hinge



SEPARATION PLANES *	MISSILE STA	INTERFACE PLANES	MISSILE STA
S-1	510.49	A	784.20
S-2	342.82	B	748.20
S-3	..	C	525.56
		D	467.66
		E	358.96
		F	319.16
TANGENT LINES		J	257.39
T3V	270.00	K	239.39
T3A	313.00	H	207.89
T2V	366.93	L	..
T2A	455.56		
T1V	532.47		
T1A	742.33		
		SKIRT REMOVAL PLANES	
		SR-1	N.A.
		SR-2	N.A.
NOZZLE HINGE LINES			
N-1	769.99		
N-2	N.A.		
N-3	327.30		



• S Explosive Chamber.
 •• To be determined.
 N.A.- Not Applicable.

REPORT NO. EM 446-448
DATE 7-24-63

BOEING RESPONSIBILITY			EXPENDED WEIGHT		TOTAL WEIGHT		CENTER OF GRAVITY			INERTIA	
LN	SC	DESCRIPTION	DATA	LB	LB	LB	LONG	LAT	VERT	SLUG FT ² X 10 ⁻³	BOLL PITCH
01	41	RV SPACER	SILO								
02			AERO								
03											
04	42	G+C SECTION	SILO								
05			AERO								
06											
07	43	R+D SECTION	SILO								
08			AERO								
09											
10	44	3RD STAGE ENGINE	SILO								
11			AERO								
12			BASE								
13	45	INTERSTAGE 2-3	SILO								
14		FWD	AERO								
15			BASE								
16											
17											
18											
19		JETTISONED	SILO								
20		PORTION	AERO								
21			BASE								
22	45	INTERSTAGE 2-3	JETT								
23		AFT									
24			SILO								
25	46	2ND STAGE ENGINE	AERO								
26											
27			SILO								
28			AERO								
29	47	INTERSTAGE 1-2	BASE								
30		FWD									
31			SILO								
32			AERO								
33			BASE								
34		JETTISONED	SILO								
35		PORTION	AERO								
36			BASE								
37	47	INTERSTAGE 1-2	JETT								
38		AFT									
39			SILO								
40	48	1ST STAGE ENGINE	AERO								
41											
42			SILO								
43			AERO								
44			BASE								
45	49	SKIRT	SILO								
46			AERO								
47			BASE								
48											
49		MISSILE	SILO								
50			AERO								
51			BASE								
52			JETT								

BOEING WEIGHT RESPONSIBILITY
MISSILE BW 446-448
DATE 7-24-63

2.3.1 Section 42 C UNEXPE

C + D
TOTAL

**D
EXPENDED**

IN FUNCTIONAL LISTING

01	RACENAYS		R
02	COVERS + CAPS		R
03	MEAT PROTECTION		R
04	SILCO		R
05	AERO		R
06	COVERS + CAPS		O
07	MEAT PROTECTION		O
08	SILCO		O
09	AERO		O
10			O

10
11
12
13
14
15
16
17

INSTRUMENTATION
EQUIPMENT + WINE
BASE MEAT PROTECTION
EQUIP + WIRE - JETT.
BASE MEAT PRO.-JETT.
SILO MEAT PROTECTION
DESTRUCT PROVISION

18
19
20
21
22

1-02 238-90 100-00 100-00

1.02	238.90	100.00	100.00
------	--------	--------	--------

24 UNJETTIS

25 SEPARATION MECH.

26 HEAT PROTECTION

27 .SILO EXTERNAL

20 AERO

.....

JEVVISON 16

32 SEPAR. MECH.- STA

33 SEPAR. MECH.- PEN

34 HEAT PROTECTION

0715 56

33 SILD
34 AERO

30 HEAD

37 BASE

357

39 ACCESS DENIED

39 7337Y 6E

841 MEAT DEFLECTOR INSTL.

• JAMES J. BOYD, JR., 24
• JAMES J. BOYD, JR., 24

42 REFLECTOR, STRUC.
43 BASE HEAT CONNECTION

43 BASE HEAT PROTECTION

44 SILD HEAT PROTECTION
45 MISCCELLANEOUS

45 MISCELLANEOUS

1

47 CONTINGENCY

1

49 UNACCOUNTED

88

91 COLUMN TOTAL IS

22

SECTION TOTAL

SECRET

2.52 238.96 100.00 100.00

2.52 238.96 100.00 100.00

2.3 BOEING WEIGHT RESPONSIBILITY 2.3.2 Section 43
MISSILE BY ALC-448
DATE 7-24-63

LN	FUNCTIONAL LISTING	UNEXPENDED				EXPENDED				E + F TOTAL			
		WT	M CG	L CG	V CG	WT	M CG	L CG	V CG	WT	M CG	L CG	V CG
01	RACEWAYS												
02	COVERS + CAPS												
03	HEAT PROTECTION												
04	SILLO												
05	AERO												
06	COVERS + CAPS												
07	HEAT PROTECTION												
08	SILLO												
09	AERO												
10													
11	INSTRUMENTATION												
12	EQUIPMENT + WIRE												
13	BASE HEAT PROTECTION												
14	EQUIP + WIRE - JETT.												
15	BASE HEAT PRO.-JETT.												
16	SILLO HEAT PROTECTION												
17	DESTRUCT PROVISION												
18													
19	G-C INSTALLATION												
20	CABLE PROV + INSTL PRO												
21	BASE HEAT PROTECTION												
22	SILLO HEAT PROTECTION												
23	STRUCTURE												
24	UNJETTISONED												
25	SEPARATION MECH.												
26	HEAT PROTECTION												
27	SILLO EXTERNAL												
28	AERO												
29	BASE												
30	SILLO INTERNAL												
31	JETTISONED												
32	SEPAR. MECH.- STAGE												
33	SEPAR. MECH.- PEEL												
34	HEAT PROTECTION												
35	SILLO												
36	AERO												
37	BASE												
38													
39	ACCELEROMETER SUPPORT												
40													
41	HEAT DEFLECTOR INSTL.												
42	DEFLECTOR + STRUC.												
43	BASE HEAT PROTECTION												
44	SILLO HEAT PROTECTION												
45	MISCELLANEOUS												
46													
47	CONTINGENCY												
48													
49	UNACCOUNTED												
50													
51	COLUMN TOTAL SECT 43	390.59	248.22	99.87	100.02	2.46	250.06	96.92	107.38	393.05	248.24	99.84	100.06
52													
53	SECTION TOTAL												

**6 • H
TOTAL**

[illegible]

2.3 BOEING WEIGHT RESPONSIBILITY		2.3.4 Section 45 Fwd		J										K		J + K	
MISSILE BW 446-448		7-24-63		UNEXPENDED										EXPENDED		TOTAL	
DATE																	
FUNCTIONAL LISTING																	
LN		WT	M CG	L CG	V CG	WT	M CG	L CG	V CG	WT	M CG	L CG	V CG	WT	M CG	L CG	V CG
01	RACEWAYS	0.21	332.24	88.14	119.99					0.21	332.24	88.14	119.99				
02	COVERS + CAPS																
03	HEAT PROTECTION																
04	SILLO	2.40	331.39	88.48	119.91	.20	330.55	88.07	120.61	.20	330.55	88.07	120.61				
05	AERO	3.32	331.07	110.95	118.89	.74	330.55	88.08	120.59	3.32	331.07	110.95	118.89				
06	COVERS + CAPS																
07	HEAT PROTECTION																
08	SILLO	1.35	331.67	111.13	119.28	.13	331.00	111.30	119.60	.13	331.00	111.30	119.60				
09	AERO					.51	331.00	111.30	119.60	1.86	331.48	111.18	119.37				
10	INSTRUMENTATION																
11	EQUIPMENT + WIRE	12.08	334.83	86.04	117.04					12.08	334.83	86.04	117.04				
12	BASE HEAT PROTECTION	.37	337.60	85.70	114.10	.04	337.60	85.70	114.10	.41	337.60	85.70	114.10				
13	EQUIP + WIRE - JETT.																
14	BASE HEAT PRO.-JETT.																
15	SILLO HEAT PROTECTION																
16	DESTRUCT PROVISION																
17																	
18	G+C INSTALLATION																
19	CABLE PROV + INSTL PRO	4.17	340.40	112.00	112.10					4.17	340.40	112.00	112.10				
20	BASE HEAT PROTECTION	.52	340.40	112.00	112.10	.05	340.40	112.00	112.10	.57	340.40	112.00	112.10				
21	SILLO HEAT PROTECTION																
22	STRUCTURE	84.82	328.54	100.88	100.83					84.82	328.54	100.88	100.83				
23	UNJETTISONED	9.47	341.03	99.04	100.06					9.47	341.03	99.04	100.06				
24	SEPARATION MECH.																
25	HEAT PROTECTION																
26	SILLO EXTERNAL	7.74	331.63	100.03	92.23	1.92	331.64	100.03	91.70	1.92	331.64	100.03	91.70				
27	AERO	34.94	329.94	100.16	99.91	4.47	331.64	100.03	91.70	12.21	331.64	100.03	92.03				
28	BASE					5.18	331.62	99.48	99.63	40.12	330.16	100.07	99.88				
29	SILLO INTERNAL																
30	JETTISONED																
31	SEPAR. MECH.- STAGE																
32	SEPAR. MECH.- PEEL																
33	HEAT PROTECTION																
34	SILLO																
35	AERO																
36	BASE																
37	ACCELEROMETER SUPPORT																
38	HEAT DEFLECTOR INSTL.																
39	DEFLECTOR + STRUC.																
40	BASE HEAT PROTECTION																
41	SILLO HEAT PROTECTION																
42	MISCELLANEOUS																
43	CONTINGENCY																
44	UNACCOUNTED																
45	COLUMN TOTAL SECT 45 FWD	169.39	330.76	99.29	103.40	13.24	331.58	99.51	98.35	182.63	330.82	99.31	103.04				
46	SECTION TOTAL																

2.3 BOEING WEIGHT RESPONSIBILITY 2.3.5 Section 45 Aft
MISSILE BW 446448
DATE 7-25-63

LM	FUNCTIONAL LISTING	UNEXPENDED				EXPENDED				L + M TOTAL			
		WT	M CG	L CG	V CG	WT	M CG	L CG	V CG	WT	M CG	L CG	V CG
01	RACEWAYS												
02	COVERS + CAPS	4.53	349.01	86.66	120.82	4.53	349.01	86.66	120.82				
03	HEAT PROTECTION												
04	SILO												
05	AERO	.98	350.46	87.11	122.37	.13	350.14	86.62	123.23	.13	350.14	86.62	123.23
06	COVERS + CAPS	3.02	350.88	113.17	122.73	.19	350.14	86.62	123.22	1.17	350.41	87.03	122.51
07	HEAT PROTECTION									3.02	350.88	113.17	122.73
08	SILO												
09	AERO	1.49	350.80	113.11	122.72	.10	350.80	113.37	123.17	.10	350.80	113.37	123.17
10	INSTRUMENTATION					.15	350.80	113.33	123.09	1.64	350.80	113.13	122.75
11	EQUIPMENT + WIRE												
12	BASE HEAT PROTECTION	12.46	344.59	91.72	118.76	12.46	344.59	91.72	118.76				
13	EQUIP + WIRE - JETT.												
14	BASE HEAT PRO.-JETT.												
15	SILO HEAT PROTECTION												
16	DESTRUCT PROVISION												
17	G+C INSTALLATION												
18	CABLE PROV + INSTL PRO	.02	347.40	109.60	121.50	.02	347.40	109.60	121.50				
19	BASE HEAT PROTECTION												
20	SILO HEAT PROTECTION												
21	STRUCTURE												
22	UNJETTISONED	52.74	352.87	101.98	102.12	52.74	352.87	101.98	102.12				
23	SEPARATION MECH.	12.56	344.73	96.57	93.62	12.56	344.73	96.57	93.62				
24	HEAT PROTECTION												
25	SILO EXTERNAL												
26	AERO	8.15	351.34	100.03	90.36	1.63	351.30	100.03	89.90	1.63	351.30	100.03	89.90
27	BASE					4.41	351.30	100.03	89.89	12.56	351.32	100.03	90.20
28	SILO INTERNAL												
29	JETTISONED												
30	SEPAR. MECH.- STAGE												
31	SEPAR. MECH.- PEEL												
32	HEAT PROTECTION												
33	SILO												
34	AERO												
35	BASE												
36	ACCELEROMETER SUPPORT												
37	HEAT DEFLECTOR INSTL.	14.25	350.00	98.90	112.27	14.25	350.00	98.90	112.27				
38	DEFLECTOR + STRUC.												
39	BASE HEAT PROTECTION												
40	SILO HEAT PROTECTION												
41	MISCELLANEOUS												
42	CONTINGENCY												
43	UNACCOUNTED												
44	COLUMN TOTAL SECT 45 AFT	110.20	350.26	99.36	105.27	6.61	351.22	99.88	92.76	116.81	350.31	99.39	104.57
45	SECTION TOTAL SECT 45	279.59	338.44	99.32	104.14	19.85	338.12	99.64	96.49	299.44	338.42	99.34	103.63

2.3 BOEING WEIGHT RESPONSIBILITY		2.3.6 Section 46		M		P		M + P	
MISSILE BW 446-448		DATE 7-24-63		UNEXPENDED		EXPENDED		TOTAL	
LN	FUNCTIONAL LISTING	WT	M CG	L CG	V CG	WT	M CG	L CG	V CG
01	RACEWAYS	10.33	410.47	86.77	122.85	10.33	410.47	86.77	122.85
02	COVERS + CAPS								
03	HEAT PROTECTION								
04	SIL0								
05	AERO								
06	COVERS + CAPS	4.22	408.72	86.42	123.48	.60	408.71	85.60	124.90
07	HEAT PROTECTION	15.48	413.10	112.79	122.17	.50	409.21	85.60	124.90
08	SIL0								
09	AERO								
10	INSTRUMENTATION	5.12	401.35	113.11	123.14	1.00	411.04	113.12	123.51
11	EQUIPMENT + WIRE					1.42	434.44	112.53	123.67
12	BASE HEAT PROTECTION								
13	EQUIP + WIRE - JETT.	22.77	437.31	90.24	118.22	1.86	480.33	90.10	105.22
14	BASE HEAT PRO.-JETT.	6.77	479.17	90.94	107.77				
15	SIL0 HEAT PROTECTION								
16	DESTRUCT PROVISION	7.02	384.74	112.21	120.43	7.02	384.74	112.21	120.43
17									
18	G+C INSTALLATION								
19	CABLE PROV + INSTL PRO	1.34	473.66	110.64	117.21	1.34	473.66	110.64	117.21
20	BASE HEAT PROTECTION	1.34	480.79	111.65	117.00	1.46	480.99	111.73	116.98
21	SIL0 HEAT PROTECTION								
22	STRUCTURE								
23	UNJETTISONED								
24	SEPARATION MECH.								
25	HEAT PROTECTION								
26	SIL0 EXTERNAL								
27	AERO								
28	BASE								
29	SIL0 INTERNAL								
30	JETTISONED								
31	SEPAR. MECH.- STAGE								
32	SEPAR. MECH.- PEEL								
33	HEAT PROTECTION								
34	SIL0								
35	AERO								
36	BASE								
37	ACCELEROMETER SUPPORT								
38	HEAT DEFLECTOR INSTL.								
39	DEFLECTOR + STRUC.								
40	BASE HEAT PROTECTION								
41	SIL0 HEAT PROTECTION								
42	MISCELLANEOUS								
43	CONTINGENCY								
44	UNACCOUNTED								
45	COLUMN TOTAL SECT 46	74.62	424.53	98.70	119.48	5.50	441.67	99.67	117.50
46	SECTION TOTAL								
47									
48									
49									
50									
51									
52									
53									

2.3.7 ROEING WEIGHT RESPONSIBILITY
MISSILE BW 446-148
DATE 7-24-65

2.3.7 Section 47 Pwd

FUNCTIONAL LISTING	UNEXPENDED				EXPENDED				Q + R TOTAL			
	WT	M CG	L CG	V CG	WT	M CG	L CG	V CG	WT	M CG	L CG	V CG
01 RACEWAYS												
02 COVERS + CAPS	1.46	466.34	85.97	124.31					1.46	466.34	85.97	124.31
03 MEAT PROTECTION												
04 SILO												
05 AERO	.82	467.47	86.10	124.15	.29	467.50	85.80	124.70	.29	467.50	85.80	124.70
06 COVERS + CAPS	6.00	487.43	114.99	126.00	.16	467.50	85.80	124.70	.98	467.47	86.06	124.24
07 MEAT PROTECTION									6.00	487.43	114.99	126.00
08 SILO												
09 AERO	2.04	487.94	115.16	126.26	.28	486.30	115.30	126.50	.28	486.30	115.30	126.50
10 INSTRUMENTATION					.86	486.30	115.30	126.50	2.90	487.45	115.20	126.33
11 EQUIPMENT + WIRE												
12 BASE MEAT PROTECTION	16.52	491.28	95.43	121.05					16.52	491.28	95.43	121.05
13 EQUIP + WIRE - JETT.	10.98	487.73	96.68	117.75	.76	499.31	90.66	120.59	11.74	488.48	96.29	117.93
14 BASE MEAT PROTECTION												
15 SILO MEAT PROTECTION												
16 DESTRUCT PROVISION												
17												
18												
19 G+C INSTALLATION												
20 CABLE PROV + INSTL PRO	4.29	505.65	123.55	117.27					4.29	505.65	123.55	117.27
21 BASE MEAT PROTECTION	2.46	506.20	123.70	117.20	.64	506.20	123.70	117.20	3.10	506.20	123.70	117.20
22 SILO MEAT PROTECTION												
23 STRUCTURE												
24 UNJETTISONED	237.98	488.09	99.93	100.67					237.98	488.09	99.93	100.67
25 SEPARATION MECH.	14.58	509.91	103.85	112.59					14.58	509.91	103.85	112.59
26 MEAT PROTECTION												
27 SILO EXTERNAL												
28 AERO	14.50	489.12	99.33	98.46	3.88	489.90	99.30	98.40	3.88	489.90	99.30	98.40
29 BASE	50.23	487.40	100.37	102.16	5.39	489.90	99.30	98.40	19.89	489.33	99.32	98.44
30 SILO INTERNAL					3.38	491.74	100.37	100.78	53.61	487.67	100.37	102.07
31 JETTISONED												
32 SEPAR. MECH.- STAGE												
33 SEPAR. MECH.- PEEL												
34 MEAT PROTECTION												
35 SILO												
36 AERO												
37 BASE												
38 ACCELEROMETER SUPPORT												
39												
40												
41 MEAT DEFLECTOR INSTL.												
42 DEFLECTOR + STRUC.												
43 BASE MEAT PROTECTION												
44 SILO MEAT PROTECTION												
45 MISCELLANEOUS												
46												
47 CONTINGENCY												
48												
49 UNACCOUNTED												
50												
51 COLUMN TOTAL SECT 47 PWD	361.86	489.23	100.51	103.74	15.64	490.51	100.89	103.57	377.50	489.29	100.53	103.73
52												
53 SECTION TOTAL												

EXPENSE

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2.3 BOEING WEIGHT RESPONSIBILITY 2.3.9 Section 48

MISSILE BW 446-448
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LN	FUNCTIONAL LISTING	UNEXPENDED				EXPENDED				U + V TOTAL			
		WT	M CG	L CG	V CG	WT	M CG	L CG	V CG	WT	M CG	L CG	V CG
01	RACEWAYS	23.35	637.12	83.00	129.32					23.35	637.12	83.00	129.32
02	COVERS + CAPS												
03	HEAT PROTECTION												
04	SILO					2.55	650.35	82.91	129.54	2.55	650.35	82.91	129.54
05	AERO	5.49	632.09	82.95	129.42	1.33	629.92	82.91	129.55	7.02	631.68	82.94	129.44
06	COVERS + CAPS	27.50	633.52	117.17	129.64					27.50	633.52	117.17	129.64
07	HEAT PROTECTION												
08	SILO					2.78	644.75	117.21	129.77	2.78	644.75	117.21	129.77
09	AERO					1.40	627.01	117.26	129.87	6.94	631.99	117.16	129.69
10		5.54	633.25	117.14	129.65								
11	INSTRUMENTATION												
12	EQUIPMENT + WIRE	23.43	638.33	83.54	128.66					23.43	638.33	83.54	128.66
13	BASE HEAT PROTECTION	2.23	771.42	106.86	112.54	.47	771.54	106.82	112.12	2.70	771.44	106.85	112.47
14	EQUIP + WIRE - JETT.												
15	BASE HEAT PRO. - JETT.												
16	SILO HEAT PROTECTION					.08	770.86	106.13	112.74	.08	770.86	106.13	112.74
17	DESTRUCT PROVISION									6.39	540.24	116.39	128.43
18		6.39	540.24	116.39	128.43								
19	G+C INSTALLATION												
20	CABLE PROV + INSTL PRO												
21	BASE HEAT PROTECTION												
22	SILO HEAT PROTECTION												
23	STRUCTURE												
24	UNJETTISONED												
25	SEPARATION MECH.												
26	HEAT PROTECTION												
27	SILO EXTERNAL												
28	AERO												
29	BASE												
30	SILO INTERNAL												
31	JETTISONED												
32	SEPAR. MECH. - STAGE												
33	SEPAR. MECH. - PEEL												
34	HEAT PROTECTION												
35	SILO												
36	AERO												
37	BASE												
38													
39	ACCELEROMETER SUPPORT												
40													
41	HEAT DEFLECTOR INSTL.	16.31	796.42	100.00	100.00					16.31	796.42	100.00	100.00
42	DEFLECTOR + STRUC.	4.70	789.13	100.00	100.00	4.86	789.64	100.00	100.00	9.56	789.40	100.00	100.00
43	BASE HEAT PROTECTION					.95	789.72	100.00	100.00	.95	789.72	100.00	100.00
44	SILO HEAT PROTECTION												
45	MISCELLANEOUS												
46													
47	CONTINGENCY												
48													
49	UNACCOUNTED												
50													
51	COLUMN TOTAL SECT 48	115.14	662.07	98.33	123.56	14.42	705.87	100.65	117.05	129.56	666.94	98.59	122.83
52													
53	SECTION TOTAL												

3 BOEING WEIGHT RESPONSIBILITY
MISSILE BW 446-448
DATE 7-24-63

2.3.10 Section 49

UNEXPENDED

EXPENDED

M + M
TOTAL

LN	FUNCTIONAL LISTING	WT	M CG	L CG	V CG	WT	M CG	L CG	V CG	WT	M CG	L CG	V CG
01	RACEMAYS												
02	COVERS + CAPS	1.00	751.52	83.49	128.51					1.00	751.52	83.49	128.51
03	HEAT PROTECTION												
04	SILO												
05	AERO												
06	COVERS + CAPS	1.00	751.52	83.49	128.51					1.00	751.52	83.49	128.51
07	HEAT PROTECTION												
08	SILO												
09	AERO												
10	INSTRUMENTATION												
11	EQUIPMENT + WIRE	7.36	770.15	85.28	127.56					7.36	770.15	85.28	127.56
12	BASE HEAT PROTECTION	6.61	761.74	92.84	126.03					6.61	761.74	92.84	126.03
13	EQUIP + WIRE - JETT.												
14	BASE HEAT PROTECTION												
15	SILO HEAT PROTECTION												
16	DESTRUCT PROVISION												
17	STRUCTURE												
18	UNJETTISONED												
19	SEPARATION MECH.												
20	HEAT PROTECTION												
21	SILO EXTERNAL												
22	AERO												
23	BASE												
24	SILO INTERNAL												
25	JETTISONED												
26	SEPAR. MECH. - STAGE												
27	SEPAR. MECH. - PEEL												
28	HEAT PROTECTION												
29	SILO												
30	AERO												
31	BASE												
32	ACCELEROMETER SUPPORT												
33	HEAT DEFLECTOR INSUL.												
34	DEFLECTOR + STRUC.												
35	BASE HEAT PROTECTION												
36	SILO HEAT PROTECTION												
37	MISCELLANEOUS												
38	CONTINGENCY												
39	UNACCOUNTED												
40	COLUMN TOTAL SECT 49	247.49	766.78	100.50	102.95	59.43	767.63	100.26	100.39	306.92	766.95	100.45	102.45
41	SECTION TOTAL	1660.09	451.00	99.68	105.04	127.07	605.23	100.12	103.82	1787.16	461.97	99.72	104.95
42	MISSILE TOTAL												